



SEQUENCE LISTING

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<120> AUTOANTIGENIC FRAGMENTS, METHODS AND
ASSAYS

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 1460 1465 1470
 Arg Glu Lys Tyr Val Gln Glu Leu Ala Ala Val Arg Ala Asp Ala Glu
 1475 1480 1485
 Thr Arg Leu Ala Glu Val Gln Arg Glu Ala Gln Ser Thr Ala Arg Glu
 1490 1495 1500
 Leu Glu Val Met Thr Ala Lys Tyr Glu Gly Ala Lys Val Lys Val Leu
 1505 1510 1515 1520
 Glu Glu Arg Gln Arg Phe Gln Glu Glu Arg Gln Lys Leu Thr Ala Gln
 1525 1530 1535
 Val Glu Gln Leu Glu Val Phe Gln Arg Glu Gln Thr Lys Gln Val Glu
 1540 1545 1550
 Glu Leu Ser Lys Lys Leu Ala Asp Ser Asp Gln Ala Ser Lys Val Gln
 1555 1560 1565
 Gln Gln Lys Leu Lys Ala Val Gln Ala Gln Gly Gly Glu Ser Gln Gln
 1570 1575 1580
 Glu Ala Gln Arg Leu Gln Ala Gln Leu Asn Glu Leu Gln Ala Gln Leu
 1585 1590 1595 1600
 Ser Gln Lys Glu Gln Ala Ala Glu His Tyr Lys Leu Gln Met Glu Lys
 1605 1610 1615
 Ala Lys Thr His Tyr Asp Ala Lys Lys Gln Gln Asn Gln Glu Leu Gln
 1620 1625 1630
 Glu Gln Leu Arg Ser Leu Glu Gln Leu Gln Lys Glu Asn Lys Glu Leu
 1635 1640 1645
 Arg Ala Glu Ala Glu Arg Leu Gly His Glu Leu Gln Gln Ala Gly Leu
 1650 1655 1660
 Lys Thr Lys Glu Ala Glu Gln Thr Cys Arg His Leu Thr Ala Gln Val
 1665 1670 1675 1680
 Arg Ser Leu Glu Ala Gln Val Ala His Ala Asp Gln Gln Leu Arg Asp
 1685 1690 1695
 Leu Gly Lys Phe Gln Val Ala Thr Asp Ala Leu Lys Ser Arg Glu Pro
 1700 1705 1710
 Gln Ala Lys Pro Gln Leu Asp Leu Ser Ile Asp Ser Leu Asp Leu Ser
 1715 1720 1725
 Cys Glu Glu Gly Thr Pro Leu Ser Ile Thr Ser Lys Leu Pro Arg Thr
 1730 1735 1740
 Gln Pro Asp Gly Thr Ser Val Pro Gly Glu Pro Ala Ser Pro Ile Ser
 1745 1750 1755 1760
 Gln Arg Leu Pro Pro Lys Val Glu Ser Leu Glu Ser Leu Tyr Phe Thr
 1765 1770 1775
 Pro Ile Pro Ala Arg Ser Gln Ala Pro Leu Glu Ser Ser Leu Asp Ser
 1780 1785 1790
 Leu Gly Asp Val Phe Gln Asp Ser Gly Arg Lys Thr Arg Ser Ala Arg
 1795 1800 1805

Arg Arg Thr Thr Gln Ile Ile Asn Ile Thr Met Thr Lys Lys Leu Asp
 1810 1815 1820
 Val Glu Glu Pro Asp Ser Ala Asn Ser Ser Phe Tyr Ser Thr Arg Ser
 1825 1830 1835 1840
 Ala Pro Ala Ser Gln Ala Ser Leu Arg Ala Thr Ser Ser Thr Gln Ser
 1845 1850 1855
 Leu Ala Arg Leu Gly Ser Pro Asp Tyr Gly Asn Ser Ala Leu Leu Ser
 1860 1865 1870
 Leu Pro Gly Tyr Arg Pro Thr Thr Arg Ser Ser Ala Arg Arg Ser Gln
 1875 1880 1885
 Ala Gly Val Ser Ser Gly Ala Pro Pro Gly Arg Asn Ser Phe Tyr Met
 1890 1895 1900
 Gly Thr Cys Gln Asp Glu Pro Glu Gln Leu Asp Asp Trp Asn Arg Ile
 1905 1910 1915 1920
 Ala Glu Leu Gln Gln Arg Asn Arg Val Cys Pro Pro His Leu Lys Thr
 1925 1930 1935
 Cys Tyr Pro Leu Glu Ser Arg Pro Ser Leu Ser Leu Gly Thr Ile Thr
 1940 1945 1950
 Asp Glu Glu Met Lys Thr Gly Asp Pro Gln Glu Thr Leu Arg Arg Ala
 1955 1960 1965
 Ser Met Gln Pro Ile Gln Ile Ala Glu Gly Thr Gly Ile Thr Thr Arg
 1970 1975 1980
 Gln Gln Arg Lys Arg Val Ser Leu Glu Pro His Gln Gly Pro Gly Thr
 1985 1990 1995 2000
 Pro Glu Ser Lys Lys Ala Thr Ser Cys Phe Pro Arg Pro Met Thr Pro
 2005 2010 2015
 Arg Asp Arg His Glu Gly Arg Lys Gln Ser Thr Thr Glu Ala Gln Lys
 2020 2025 2030
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 2035 2040 2045
 Ala Phe Ser Ile Leu Asn Thr Pro Lys Lys Leu Gly Asn Ser Leu Leu
 2050 2055 2060
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 Ala Lys His
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 <213> Human

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 <223> Xaa = Any Amino Acid

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 Gln Leu Ile Arg Gly Leu Gly Gln Glu Cys Val Leu Ser Ser Ser Pro
 35 40 45
 Ala Val Leu Ala Leu Gln Thr Ser Leu Val Phe Ser Arg Asp Phe Gly
 50 55 60
 Leu Leu Val Phe Val Arg Lys Ser Leu Asn Ser Ile Glu Phe Arg Glu
 65 70 75 80
 Cys Arg Glu Glu Ile Leu Lys Phe Leu Cys Ile Phe Leu Glu Lys Met
 85 90 95
 Gly Gln Lys Ile Ala Pro Tyr Ser Val Glu Ile Lys Asn Thr Cys Thr
 100 105 110
 Ser Val Tyr Thr Lys Asp Arg Ala Ala Lys Cys Lys Ile Pro Ala Leu
 115 120 125
 Asp Leu Leu Ile Lys Leu Leu Gln Thr Phe Arg Ser Ser Arg Leu Met
 130 135 140
 Asp Glu Phe Lys Ile Gly Glu Leu Phe Ser Lys Phe Tyr Gly Glu Leu
 145 150 155 160
 Ala Leu Lys Lys Lys Ile Pro Asp Thr Val Leu Glu Lys Val Tyr Glu
 165 170 175
 Leu Leu Gly Leu Leu Gly Glu Val His Pro Ser Glu Met Ile Asn Asn
 180 185 190
 Ala Glu Asn Leu Phe Arg Ala Phe Leu Gly Glu Leu Lys Thr Gln Met
 195 200 205
 Thr Ser Ala Val Arg Glu Pro Lys Leu Pro Val Leu Ala Gly Cys Leu
 210 215 220
 Lys Gly Leu Ser Ser Leu Leu Cys Asn Phe Thr Lys Ser Met Glu Glu
 225 230 235 240
 Asp Pro Gln Thr Ser Arg Glu Ile Phe Asn Phe Val Leu Lys Ala Ile
 245 250 255
 Arg Pro Gln Ile Asp Leu Lys Arg Tyr Ala Val Pro Ser Ala Gly Leu
 260 265 270
 Arg Leu Phe Ala Leu His Ala Ser Gln Phe Ser Thr Cys Leu Leu Asp
 275 280 285
 Asn Tyr Val Ser Leu Phe Glu Val Leu Ile Lys Trp Cys Ala His Thr
 290 295 300
 Asn Val Glu Leu Lys Lys Ala Ala Leu Ser Ala Leu Glu Ser Phe Leu
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 Lys Gln Val Ser Asn Met Val Ala Lys Asn Ala Glu Met His Lys Asn
 325 330 335
 Lys Leu Gln Tyr Glu Met Glu Gln Phe Tyr Gly Ile Ile Arg Asn Val
 340 345 350
 Asp Ser Asn Asn Lys Glu Leu Ser Ile Ala Ile Arg Gly Tyr Gly Leu
 355 360 365
 Phe Ala Gly Pro Cys Lys Val Ile Asn Ala Lys Asp Val Asp Phe Met
 370 375 380
 Tyr Val Glu Leu Ile Gln Arg Cys Lys Gln Met Phe Leu Thr Gln Thr
 385 390 395 400
 Asp Thr Gly Asp Tyr Arg Val Tyr Gln Met Pro Ser Phe Leu Gln Ser
 405 410 415
 Val Ala Ser Val Leu Leu Tyr Leu Asp Thr Val Pro Glu Val Tyr Thr
 420 425 430
 Pro Val Leu Glu His Leu Val Val Met Gln Ile Asp Ser Phe Pro Gln
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Tyr Ser Pro Lys Met Gln Leu Val Cys Cys Arg Ala Ile Val Lys Val
450          455          460
Phe Leu Ala Leu Ala Ala Lys Gly Pro Val Leu Arg Asn Cys Ile Ser
465          470          475          480
Thr Val Val His Gln Gly Leu Ile Arg Ile Cys Ser Lys Pro Val Val
485          490          495
Leu Pro Lys Gly Pro Glu Ser Glu Ser Glu Asp His Arg Ala Ser Gly
500          505          510
Glu Val Arg Thr Gly Lys Trp Lys Val Pro Thr Tyr Lys Asp Tyr Val
515          520          525
Asp Leu Phe Arg His Leu Leu Ser Ser Asp Gln Met Met Asp Ser Ile
530          535          540
Leu Ala Asp Glu Ala Phe Phe Ser Val Asn Ser Ser Ser Glu Ser Leu
545          550          555          560
Asn His Leu Leu Tyr Asp Glu Phe Val Lys Ser Val Leu Lys Ile Val
565          570          575
Glu Lys Leu Asp Leu Thr Leu Glu Ile Gln Thr Val Gly Glu Gln Glu
580          585          590
Asn Gly Asp Glu Ala Pro Gly Val Trp Met Ile Pro Thr Ser Asp Pro
595          600          605
Ala Ala Asn Leu His Pro Ala Lys Pro Lys Asp Phe Ser Ala Phe Ile
610          615          620
Asn Leu Val Glu Phe Cys Arg Glu Ile Leu Pro Glu Lys Gln Ala Glu
625          630          635          640
Phe Phe Glu Pro Trp Val Tyr Ser Phe Ser Tyr Glu Leu Ile Leu Gln
645          650          655
Ser Thr Arg Leu Pro Leu Ile Ser Gly Phe Tyr Lys Leu Leu Ser Ile
660          665          670
Thr Val Arg Asn Ala Lys Lys Ile Lys Tyr Phe Glu Gly Val Ser Pro
675          680          685
Lys Ser Leu Lys His Ser Pro Glu Asp Pro Glu Lys Tyr Ser Cys Phe
690          695          700
Ala Leu Phe Val Lys Phe Gly Lys Glu Val Ala Val Lys Met Lys Gln
705          710          715          720
Tyr Lys Asp Glu Leu Leu Ala Ser Cys Leu Thr Phe Leu Leu Ser Leu
725          730          735
Pro His Asn Ile Ile Glu Leu Asp Val Arg Ala Tyr Val Pro Ala Leu
740          745          750
Gln Met Ala Phe Lys Leu Gly Leu Ser Tyr Thr Pro Leu Ala Glu Val
755          760          765
Gly Leu Asn Ala Leu Glu Glu Trp Ser Ile Tyr Ile Asp Arg His Val
770          775          780
Met Gln Pro Tyr Tyr Lys Asp Ile Leu Pro Cys Leu Asp Gly Tyr Leu
785          790          795          800
Lys Thr Ser Ala Leu Ser Asp Glu Thr Lys Asn Asn Trp Glu Val Ser
805          810          815
Ala Leu Ser Arg Ala Ala Gln Lys Gly Phe Asn Lys Val Val Leu Lys
820          825          830
His Leu Lys Lys Thr Lys Asn Leu Ser Ser Asn Glu Ala Ile Ser Leu
835          840          845
Glu Glu Ile Arg Ile Arg Val Val Gln Met Leu Gly Ser Leu Gly Gly
850          855          860
Gln Ile Asn Lys Asn Leu Leu Thr Val Thr Ser Ser Asp Glu Met Met
865          870          875          880

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Lys Ser Tyr Val Ala Trp Asp Arg Glu Lys Arg Leu Ser Phe Ala Val
 885 890 895
 Pro Phe Arg Glu Met Lys Pro Val Ile Phe Leu Asp Val Phe Leu Pro
 900 905 910
 Arg Val Thr Glu Leu Ala Leu Thr Ala Ser Asp Arg Gln Thr Lys Val
 915 920 925
 Ala Ala Cys Glu Leu Leu His Ser Met Val Met Phe Met Leu Gly Lys
 930 935 940
 Ala Thr Gln Met Pro Glu Gly Gly Gln Gly Ala Pro Pro Met Tyr Gln
 945 950 955 960
 Leu Tyr Lys Arg Thr Phe Pro Val Leu Leu Arg Leu Ala Cys Asp Val
 965 970 975
 Asp Gln Val Thr Arg Gln Leu Tyr Glu Pro Leu Val Met Gln Leu Ile
 980 985 990
 His Trp Phe Thr Asn Asn Lys Lys Phe Glu Ser Gln Asp Thr Val Ser
 995 1000 1005
 Leu Leu Glu Ala Ile Leu Asp Gly Ile Val Asp Pro Val Asp Ser Thr
 1010 1015 1020
 Leu Arg Asp Phe Cys Gly Arg Cys Ile Arg Glu Phe Leu Lys Trp Ser
 1025 1030 1035 1040
 Ile Lys Gln Ile Thr Pro Gln Gln Gln Glu Lys Ser Pro Val Asn Thr
 1045 1050 1055
 Lys Ser Leu Phe Lys Arg Leu Tyr Ser Leu Ala Leu His Pro Asn Ala
 1060 1065 1070
 Phe Lys Arg Leu Gly Ala Ser Leu Ala Phe Asn Asn Ile Tyr Arg Glu
 1075 1080 1085
 Phe Arg Glu Glu Glu Ser Leu Val Glu Gln Phe Val Phe Glu Ala Leu
 1090 1095 1100
 Val Ile Tyr Met Glu Ser Leu Ala Leu Ala His Ala Asp Glu Lys Ser
 1105 1110 1115 1120
 Leu Gly Thr Ile Gln Gln Cys Cys Asp Ala Ile Asp His Leu Cys Arg
 1125 1130 1135
 Ile Ile Glu Lys Lys His Val Ser Leu Asn Lys Ala Lys Lys Arg Arg
 1140 1145 1150
 Leu Pro Arg Gly Phe Pro Pro Ser Ala Ser Leu Cys Leu Leu Asp Leu
 1155 1160 1165
 Val Lys Trp Leu Leu Ala His Cys Gly Arg Pro Gln Thr Glu Cys Arg
 1170 1175 1180
 His Lys Ser Ile Glu Leu Phe Tyr Lys Phe Val Pro Leu Leu Pro Gly
 1185 1190 1195 1200
 Asn Arg Ser Pro Asn Leu Trp Leu Lys Asp Val Leu Lys Glu Glu Gly
 1205 1210 1215
 Val Ser Phe Leu Ile Asn Thr Phe Glu Gly Gly Cys Gly Gln Pro
 1220 1225 1230
 Ser Gly Ile Leu Ala Gln Pro Thr Leu Leu Tyr Leu Arg Gly Pro Phe
 1235 1240 1245
 Ser Leu Gln Ala Thr Leu Cys Trp Leu Asp Leu Leu Leu Ala Ala Leu
 1250 1255 1260
 Glu Cys Tyr Asn Thr Phe Ile Gly Glu Arg Thr Val Gly Ala Leu Gln
 1265 1270 1275 1280
 Val Leu Gly Thr Glu Ala Gln Ser Ser Leu Leu Lys Ala Val Ala Phe
 1285 1290 1295
 Phe Leu Glu Ser Ile Ala Met His Asp Ile Ile Ala Ala Glu Lys Cys
 1300 1305 1310

Phe Gly Thr Gly Ala Ala Gly Asn Arg Thr Ser Pro Gln Glu Gly Glu
 1315 1320 1325
 Arg Tyr Asn Tyr Ser Lys Cys Thr Val Val Val Arg Ile Met Glu Phe
 1330 1335 1340
 Thr Thr Thr Leu Leu Asn Thr Ser Pro Glu Gly Trp Lys Leu Leu Lys
 1345 1350 1355 1360
 Lys Asp Leu Cys Asn Thr His Leu Met Arg Val Leu Val Gln Thr Leu
 1365 1370 1375
 Cys Glu Pro Ala Ser Ile Gly Phe Asn Ile Gly Asp Val Gln Val Met
 1380 1385 1390
 Ala His Leu Pro Asp Val Cys Val Asn Leu Met Lys Ala Leu Lys Met
 1395 1400 1405
 Ser Pro Tyr Lys Asp Ile Leu Glu Thr His Leu Arg Glu Lys Ile Thr
 1410 1415 1420
 Ala Gln Ser Ile Glu Glu Leu Cys Ala Val Asn Leu Tyr Gly Pro Asp
 1425 1430 1435 1440
 Ala Gln Val Asp Arg Ser Arg Leu Ala Ala Val Val Ser Ala Cys Lys
 1445 1450 1455
 Gln Leu His Arg Ala Gly Leu Leu His Asn Ile Leu Pro Ser Gln Ser
 1460 1465 1470
 Thr Asp Leu His His Ser Val Gly Thr Glu Leu Leu Ser Leu Val Tyr
 1475 1480 1485
 Lys Gly Ile Ala Pro Gly Asp Glu Arg Gln Cys Leu Pro Ser Leu Asp
 1490 1495 1500
 Leu Ser Cys Lys Gln Leu Ala Ser Gly Leu Leu Glu Leu Ala Phe Ala
 1505 1510 1515 1520
 Phe Gly Gly Leu Cys Glu Arg Leu Val Ser Leu Leu Leu Asn Pro Ala
 1525 1530 1535
 Val Leu Ser Thr Ala Ser Leu Gly Ser Ser Gln Gly Ser Val Ile His
 1540 1545 1550
 Phe Ser His Gly Glu Tyr Phe Tyr Ser Leu Phe Ser Glu Thr Ile Asn
 1555 1560 1565
 Thr Glu Leu Leu Lys Asn Leu Asp Leu Ala Val Leu Glu Leu Met Gln
 1570 1575 1580
 Ser Ser Val Asp Asn Thr Lys Met Val Ser Ala Val Leu Asn Gly Met
 1585 1590 1595 1600
 Leu Asp Gln Ser Phe Arg Glu Arg Ala Asn Gln Lys His Gln Gly Leu
 1605 1610 1615
 Lys Leu Ala Thr Thr Ile Leu Gln His Trp Lys Lys Cys Asp Ser Trp
 1620 1625 1630
 Trp Ala Lys Asp Ser Pro Leu Glu Thr Lys Met Ala Val Leu Ala Leu
 1635 1640 1645
 Leu Ala Lys Ile Leu Gln Ile Asp Ser Ser Val Ser Phe Asn Thr Ser
 1650 1655 1660
 His Gly Ser Phe Pro Glu Val Phe Thr Thr Tyr Ile Ser Leu Leu Ala
 1665 1670 1675 1680
 Asp Thr Lys Leu Asp Leu His Leu Lys Gly Gln Ala Val Thr Leu Leu
 1685 1690 1695
 Pro Phe Phe Thr Ser Leu Thr Gly Gly Ser Leu Glu Glu Leu Arg Arg
 1700 1705 1710
 Val Leu Glu Gln Leu Ile Val Ala His Phe Pro Met Gln Ser Arg Glu
 1715 1720 1725
 Phe Pro Pro Gly Thr Pro Arg Phe Asn Asn Tyr Val Asp Cys Met Lys
 1730 1735 1740

Lys Phe Leu Asp Ala Leu Glu Leu Ser Gln Ser Pro Met Leu Leu Glu
 1745 1750 1755 1760
 Leu Met Thr Glu Val Leu Cys Arg Glu Gln Gln His Val Met Glu Glu
 1765 1770 1775
 Leu Phe Gln Ser Ser Phe Arg Arg Ile Ala Arg Arg Gly Ser Cys Val
 1780 1785 1790
 Thr Gln Val Gly Leu Leu Glu Ser Val Tyr Glu Met Phe Arg Lys Asp
 1795 1800 1805
 Asp Pro Arg Leu Ser Phe Thr Arg Gln Ser Phe Val Asp Arg Ser Leu
 1810 1815 1820
 Leu Thr Leu Leu Trp His Cys Ser Leu Asp Ala Leu Arg Glu Phe Phe
 1825 1830 1835 1840
 Ser Thr Ile Val Val Asp Ala Ile Asp Val Leu Lys Ser Arg Phe Thr
 1845 1850 1855
 Lys Leu Asn Glu Ser Thr Phe Asp Thr Gln Ile Thr Lys Lys Met Gly
 1860 1865 1870
 Tyr Tyr Lys Ile Leu Asp Val Met Tyr Ser Arg Leu Pro Lys Asp Asp
 1875 1880 1885
 Val His Ala Lys Glu Ser Lys Ile Asn Gln Val Phe His Gly Ser Cys
 1890 1895 1900
 Ile Thr Glu Gly Asn Glu Leu Thr Lys Thr Leu Ile Lys Leu Cys Tyr
 1905 1910 1915 1920
 Asp Ala Phe Thr Glu Asn Met Ala Gly Glu Asn Gln Leu Leu Glu Arg
 1925 1930 1935
 Arg Arg Leu Tyr His Cys Ala Ala Tyr Asn Cys Ala Ile Ser Val Ile
 1940 1945 1950
 Cys Cys Val Phe Asn Glu Leu Lys Phe Tyr Gln Gly Phe Leu Phe Ser
 1955 1960 1965
 Glu Lys Pro Glu Lys Asn Leu Leu Ile Phe Glu Asn Leu Ile Asp Leu
 1970 1975 1980
 Lys Arg Arg Tyr Asn Phe Pro Val Glu Val Glu Val Pro Met Glu Arg
 1985 1990 1995 2000
 Lys Lys Lys Tyr Ile Glu Ile Arg Lys Glu Ala Arg Glu Ala Ala Asn
 2005 2010 2015
 Gly Asp Ser Asp Gly Pro Ser Tyr Met Ser Ser Leu Ser Tyr Leu Ala
 2020 2025 2030
 Asp Ser Thr Leu Ser Glu Glu Met Ser Gln Phe Asp Phe Ser Thr Gly
 2035 2040 2045
 Val Gln Ser Tyr Ser Tyr Ser Ser Gln Asp Pro Arg Pro Ala Thr Gly
 2050 2055 2060
 Arg Phe Arg Arg Arg Glu Gln Arg Asp Pro Thr Val His Asp Asp Val
 2065 2070 2075 2080
 Leu Glu Leu Glu Met Asp Glu Leu Asn Arg His Glu Cys Met Ala Pro
 2085 2090 2095
 Leu Thr Ala Leu Val Lys His Met His Arg Ser Leu Gly Pro Pro Gln
 2100 2105 2110
 Gly Glu Glu Asp Ser Val Pro Arg Asp Leu Pro Ser Trp Met Lys Phe
 2115 2120 2125
 Leu His Gly Lys Leu Gly Asn Pro Ile Val Pro Leu Asn Ile Arg Leu
 2130 2135 2140
 Phe Leu Ala Lys Leu Val Ile Asn Thr Glu Glu Val Phe Arg Pro Tyr
 2145 2150 2155 2160
 Ala Lys His Trp Leu Ser Pro Leu Leu Gln Leu Ala Ala Ser Glu Asn
 2165 2170 2175

Asn Gly Gly Glu Gly Ile His Tyr Met Val Val Glu Ile Val Ala Thr
 2180 2185 2190
 Ile Leu Ser Trp Thr Gly Leu Ala Thr Pro Thr Gly Val Pro Lys Asp
 2195 2200 2205
 Glu Val Leu Ala Asn Arg Leu Leu Asn Phe Leu Met Lys His Val Phe
 2210 2215 2220
 His Pro Lys Arg Ala Val Phe Arg His Asn Leu Glu Ile Ile Lys Thr
 2225 2230 2235 2240
 Leu Val Glu Cys Trp Lys Asp Cys Leu Ser Ile Pro Tyr Arg Leu Ile
 2245 2250 2255
 Phe Glu Lys Phe Ser Gly Lys Asp Pro Asn Ser Lys Asp Asn Ser Val
 2260 2265 2270
 Gly Ile Gln Leu Leu Gly Ile Val Met Ala Asn Asp Leu Pro Pro Tyr
 2275 2280 2285
 Asp Pro Gln Cys Gly Ile Gln Ser Ser Glu Tyr Phe Gln Ala Leu Val
 2290 2295 2300
 Asn Asn Met Ser Phe Val Arg Tyr Lys Glu Val Tyr Ala Ala Ala Ala
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 2325 2330 2335
 Leu Glu Glu Ser Leu Cys Glu Leu Val Ala Lys Gln Leu Lys Gln His
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 Gln Asn Thr Met Glu Asp Lys Phe Ile Val Cys Leu Asn Lys Val Thr
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 Lys Ser Phe Pro Pro Leu Ala Asp Arg Phe Met Asn Ala Val Phe Phe
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 Leu Leu Pro Lys Phe His Gly Val Leu Lys Thr Leu Cys Leu Glu Val
 2385 2390 2395 2400
 Val Leu Cys Arg Val Glu Gly Met Thr Glu Leu Tyr Phe Gln Leu Lys
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 Ser Lys Asp Phe Val Gln Val Met Arg His Arg Asp Glu Arg Gln Lys
 2420 2425 2430
 Val Cys Leu Asp Ile Ile Tyr Lys Met Met Pro Lys Leu Lys Pro Val
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 Asp Asn Tyr Arg Asp Pro Glu Ser Glu Thr Asp Asn Asp Ser Gln Glu
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 Glu His Pro Leu Ser Glu Cys Glu Phe Gln Glu Tyr Thr Ile Asp Ser
 2580 2585 2590
 Asp Trp Arg Phe Arg Ser Thr Val Leu Thr Pro Met Phe Val Glu Thr
 2595 2600 2605

Gln Ala Ser Gln Gly Thr Leu Gln Thr Arg Thr Gln Glu Gly Ser Leu
 2610 2615 2620
 Ser Ala Arg Trp Pro Val Ala Gly Gln Ile Arg Ala Thr Gln Gln Gln
 2625 2630 2635 2640
 His Asp Phe Thr Leu Thr Gln Thr Ala Asp Gly Arg Ser Ser Phe Asp
 2645 2650 2655
 Trp Leu Thr Gly Ser Ser Thr Asp Pro Leu Val Asp His Thr Ser Pro
 2660 2665 2670
 Ser Ser Asp Ser Leu Leu Phe Ala His Lys Arg Ser Glu Arg Leu Gln
 2675 2680 2685
 Arg Ala Pro Leu Lys Ser Val Gly Pro Asp Phe Gly Lys Lys Arg Leu
 2690 2695 2700
 Gly Leu Pro Gly Asp Glu Val Asp Asn Lys Val Lys Gly Ala Ala Gly
 2705 2710 2715 2720
 Arg Thr Asp Leu Leu Arg Leu Arg Arg Arg Phe Met Arg Asp Gln Glu
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 Lys Leu Ser Leu Met Tyr Ala Arg Lys Gly Val Ala Glu Gln Lys Arg
 2740 2745 2750
 Glu Lys Glu Ile Lys Ser Glu Leu Lys Met Lys Gln Asp Ala Gln Val
 2755 2760 2765
 Val Leu Tyr Arg Ser Tyr Arg His Gly Asp Leu Pro Asp Ile Gln Ile
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 2930 2935 2940
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 2965 2970 2975
 Lys Gln Asp Trp Val Asp Gly Glu Pro Thr Glu Ala Glu Lys Asp Phe
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 Trp Glu Leu Ala Ser Leu Asp Cys Tyr Asn His Leu Ala Glu Trp Lys
 2995 3000 3005
 Ser Leu Glu Tyr Cys Ser Thr Ala Ser Ile Asp Ser Glu Asn Pro Pro
 3010 3015 3020
 Asp Leu Asn Lys Ile Trp Ser Glu Pro Phe Tyr Gln Glu Thr Tyr Leu
 3025 3030 3035 3040

Pro Tyr Met Ile Arg Ser Lys Leu Lys Leu Leu Leu Gln Gly Glu Ala
 3045 3050 3055
 Asp Gln Ser Leu Leu Thr Phe Ile Asp Lys Ala Met His Gly Glu Leu
 3060 3065 3070
 Gln Lys Ala Ile Leu Glu Leu His Tyr Ser Gln Glu Leu Ser Leu Leu
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 Tyr Leu Leu Gln Asp Asp Val Asp Arg Ala Lys Tyr Tyr Ile Gln Asn
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 Gly Ile Gln Ser Phe Met Gln Asn Tyr Ser Ser Ile Asp Val Leu Leu
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 His Gln Ser Arg Leu Thr Lys Leu Gln Ser Val Gln Ala Leu Thr Glu
 3125 3130 3135
 Ile Gln Glu Phe Ile Ser Phe Ile Ser Lys Gln Gly Asn Leu Ser Ser
 3140 3145 3150
 Gln Val Pro Leu Lys Arg Leu Leu Asn Thr Trp Thr Asn Arg Tyr Pro
 3155 3160 3165
 Asp Ala Lys Met Asp Pro Met Asn Ile Trp Asp Asp Ile Ile Thr Asn
 3170 3175 3180
 Arg Cys Phe Phe Leu Ser Lys Ile Glu Glu Lys Leu Thr Pro Leu Pro
 3185 3190 3195 3200
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 Met Glu Val Gln Glu Gln Glu Glu Asp Ile Ser Ser Leu Ile Arg Ser
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 Cys Lys Phe Ser Met Lys Met Lys Met Ile Asp Ser Ala Arg Lys Gln
 3235 3240 3245
 Asn Asn Phe Ser Leu Ala Met Lys Leu Leu Lys Glu Leu His Lys Glu
 3250 3255 3260
 Ser Lys Thr Arg Asp Asp Trp Leu Val Ser Trp Val Gln Ser Tyr Cys
 3265 3270 3275 3280
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 3315 3320 3325
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 3330 3335 3340
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 3345 3350 3355 3360
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 Tyr Gln Arg Ala Phe Gln His Leu Ser Glu Ala Val Gln Ala Ala Glu
 3380 3385 3390
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 Ile Asp Ala Tyr Met Thr Leu Ala Asp Phe Cys Asp Gln Gln Leu Arg
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 Lys Glu Glu Glu Asn Ala Ser Val Thr Asp Ser Ala Glu Leu Gln Ala
 3425 3430 3435 3440
 Tyr Pro Ala Leu Val Val Glu Lys Met Leu Lys Ala Leu Lys Leu Asn
 3445 3450 3455
 Ser Asn Glu Ala Arg Leu Lys Phe Pro Arg Leu Leu Gln Ile Ile Glu
 3460 3465 3470

Arg Tyr Pro Glu Glu Thr Leu Ser Leu Met Thr Lys Glu Ile Ser Ser
 3475 3480 3485
 Val Pro Cys Trp Gln Phe Ile Ser Trp Ile Ser His Met Val Ala Leu
 3490 3495 3500
 Leu Asp Lys Asp Gln Ala Val Ala Val Gln His Ser Val Glu Glu Ile
 3505 3510 3515 3520
 Thr Asp Asn Tyr Pro Gln Ala Ile Val Tyr Pro Phe Ile Ile Ser Ser
 3525 3530 3535
 Glu Ser Tyr Ser Phe Lys Asp Thr Ser Thr Gly His Lys Asn Lys Glu
 3540 3545 3550
 Phe Val Ala Arg Ile Lys Ser Lys Leu Asp Gln Gly Gly Val Ile Gln
 3555 3560 3565
 Asp Phe Ile Asn Ala Leu Asp Gln Leu Ser Asn Pro Glu Leu Leu Phe
 3570 3575 3580
 Lys Asp Trp Ser Asn Asp Val Arg Ala Glu Leu Ala Lys Thr Pro Val
 3585 3590 3595 3600
 Asn Lys Lys Asn Ile Glu Lys Met Tyr Glu Arg Met Tyr Ala Ala Leu
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 Gly Asp Pro Lys Ala Pro Gly Leu Gly Ala Phe Arg Arg Lys Phe Ile
 3620 3625 3630
 Gln Thr Phe Gly Lys Glu Phe Asp Lys His Phe Gly Lys Gly Gly Ser
 3635 3640 3645
 Lys Leu Leu Arg Met Lys Leu Ser Asp Phe Asn Asp Ile Thr Asn Met
 3650 3655 3660
 Leu Leu Leu Lys Met Asn Lys Asp Ser Lys Pro Pro Gly Asn Leu Lys
 3665 3670 3675 3680
 Glu Cys Ser Pro Trp Met Ser Asp Phe Lys Val Glu Phe Leu Arg Asn
 3685 3690 3695
 Glu Leu Glu Ile Pro Gly Gln Tyr Asp Gly Arg Gly Lys Pro Leu Pro
 3700 3705 3710
 Glu Tyr His Val Arg Ile Ala Gly Phe Asp Glu Arg Val Thr Val Met
 3715 3720 3725
 Ala Ser Leu Arg Arg Pro Lys Arg Ile Ile Ile Arg Gly His Asp Glu
 3730 3735 3740
 Arg Glu His Pro Phe Leu Val Lys Gly Gly Glu Asp Leu Arg Gln Asp
 3745 3750 3755 3760
 Gln Arg Val Glu Gln Leu Phe Gln Val Met Asn Gly Ile Leu Ala Gln
 3765 3770 3775
 Asp Ser Ala Cys Ser Gln Arg Ala Leu Gln Leu Arg Thr Tyr Ser Val
 3780 3785 3790
 Val Pro Met Thr Ser Ser Asp Pro Arg Ala Pro Pro Cys Glu Tyr Lys
 3795 3800 3805
 Asp Trp Leu Thr Lys Met Ser Gly Lys His Asp Val Gly Ala Tyr Met
 3810 3815 3820
 Leu Met Tyr Lys Gly Ala Asn Arg Thr Glu Thr Val Thr Ser Glu Arg
 3825 3830 3835 3840
 Lys Arg Glu Ser Lys Val Pro Ala Asp Leu Leu Lys Arg Ala Phe Val
 3845 3850 3855
 Arg Met Ser Thr Ser Pro Glu Ala Phe Leu Ala Leu Arg Ser His Phe
 3860 3865 3870
 Ala Ser Ser His Ala Leu Ile Cys Ile Ser His Trp Ile Leu Gly Ile
 3875 3880 3885
 Gly Asp Arg His Leu Asn Asn Phe Met Val Ala Met Glu Thr Gly Gly
 3890 3895 3900

Val Ile Gly Ile Asp Phe Gly His Ala Phe Gly Ser Ala Thr Gln Phe
 3905 3910 3915 3920
 Leu Pro Val Pro Glu Leu Met Pro Phe Arg Leu Thr Arg Gln Phe Ile
 3925 3930 3935
 Asn Leu Met Leu Pro Met Lys Glu Thr Gly Leu Met Tyr Ser Ile Met
 3940 3945 3950
 Val His Ala Leu Arg Ala Phe Arg Ser Asp Pro Gly Leu Leu Thr Asn
 3955 3960 3965
 Thr Met Asp Val Phe Val Lys Glu Pro Ser Phe Asp Trp Lys Asn Phe
 3970 3975 3980
 Glu Gln Lys Met Leu Lys Lys Gly Gly Ser Trp Ile Gln Glu Ile Asn
 3985 3990 3995 4000
 Val Ala Glu Lys Asn Trp Tyr Pro Arg Gln Lys Ile Cys Tyr Ala Lys
 4005 4010 4015
 Arg Lys Leu Ala Gly Ala Asn Pro Ala Val Ile Thr Cys Asp Glu Leu
 4020 4025 4030
 Leu Leu Gly His Glu Lys Ala Pro Ala Phe Arg Asp Tyr Val Ala Val
 4035 4040 4045
 Ala Arg Gly Ser Lys Asp His Asn Ile Arg Ala Gln Glu Pro Glu Ser
 4050 4055 4060
 Gly Leu Ser Glu Glu Thr Gln Val Lys Cys Ile Met Asp Gln Ala Thr
 4065 4070 4075 4080
 Asp Pro Asn Ile Leu Gly Arg Thr Trp Glu Gly Trp Glu Pro Trp Met
 4085 4090 4095

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 Leu Arg Met Ala Ile Met Val Gln Ser Pro Met Phe Asp Gly Lys Val
 35 40 45
 Pro His Trp Tyr His Phe Ser Cys Phe Trp Lys Val Gly His Ser Ile
 50 55 60
 Arg His Pro Asp Val Glu Val Asp Gly Phe Ser Glu Leu Arg Trp Asp
 65 70 75 80
 Asp Gln Gln Lys Val Lys Lys Thr Ala Glu Ala Gly Gly Val Thr Gly
 85 90 95
 Lys Gly Gln Asp Gly Ile Gly Ser Lys Ala Glu Lys Thr Leu Gly Asp
 100 105 110
 Phe Ala Ala Glu Tyr Ala Lys Ser Asn Arg Ser Thr Cys Lys Gly Cys
 115 120 125
 Met Glu Lys Ile Glu Lys Gly Gln Val Arg Leu Ser Lys Lys Met Val
 130 135 140
 Asp Pro Glu Lys Pro Gln Leu Gly Met Ile Asp Arg Trp Tyr His Pro
 145 150 155 160

Gly	Cys	Phe	Val	Lys	Asn	Arg	Glu	Glu	Leu	Gly	Phe	Arg	Pro	Glu	Tyr
				165					170					175	
Ser	Ala	Ser	Gln	Leu	Lys	Gly	Phe	Ser	Leu	Leu	Ala	Thr	Glu	Asp	Lys
			180					185					190		
Glu	Ala	Leu	Lys	Lys	Gln	Leu	Pro	Gly	Val	Lys	Ser	Glu	Gly	Lys	Arg
		195					200					205			
Lys	Gly	Asp	Glu	Val	Asp	Gly	Val	Asp	Glu	Val	Ala	Lys	Lys	Lys	Ser
	210					215					220				
Lys	Lys	Glu	Lys	Asp	Lys	Asp	Ser	Lys	Leu	Glu	Lys	Ala	Leu	Lys	Ala
225					230					235					240
Gln	Asn	Asp	Leu	Ile	Trp	Asn	Ile	Lys	Asp	Glu	Leu	Lys	Lys	Val	Cys
				245					250					255	
Ser	Thr	Asn	Asp	Leu	Lys	Glu	Leu	Leu	Ile	Phe	Asn	Lys	Gln	Gln	Val
			260					265					270		
Pro	Ser	Gly	Glu	Ser	Ala	Ile	Leu	Asp	Arg	Val	Ala	Asp	Gly	Met	Val
		275					280					285			
Phe	Gly	Ala	Leu	Leu	Pro	Cys	Glu	Glu	Cys	Ser	Gly	Gln	Leu	Val	Phe
	290					295					300				
Lys	Ser	Asp	Ala	Tyr	Tyr	Cys	Thr	Gly	Asp	Val	Thr	Ala	Trp	Thr	Lys
305					310					315					320
Cys	Met	Val	Lys	Thr	Gln	Thr	Pro	Asn	Arg	Lys	Glu	Trp	Val	Thr	Pro
				325					330					335	
Lys	Glu	Phe	Arg	Glu	Ile	Ser	Tyr	Leu	Lys	Lys	Leu	Lys	Val	Lys	Lys
			340					345					350		
Gln	Asp	Arg	Ile	Phe	Pro	Pro	Glu	Thr	Ser	Ala	Ser	Val	Ala	Ala	Thr
	355						360					365			
Pro	Pro	Pro	Ser	Thr	Ala	Ser	Ala	Pro	Ala	Ala	Val	Asn	Ser	Ser	Ala
	370					375					380				
Ser	Ala	Asp	Lys	Pro	Leu	Ser	Asn	Met	Lys	Ile	Leu	Thr	Leu	Gly	Lys
385					390					395					400
Leu	Ser	Arg	Asn	Lys	Asp	Glu	Val	Lys	Ala	Met	Ile	Glu	Lys	Leu	Gly
			405						410					415	
Gly	Lys	Leu	Thr	Gly	Thr	Ala	Asn	Lys	Ala	Ser	Leu	Cys	Ile	Ser	Thr
			420					425					430		
Lys	Lys	Glu	Val	Glu	Lys	Met	Asn	Lys	Lys	Met	Glu	Glu	Val	Lys	Glu
		435					440					445			
Ala	Asn	Ile	Arg	Val	Val	Ser	Glu	Asp	Phe	Leu	Gln	Asp	Val	Ser	Ala
	450					455					460				
Ser	Thr	Lys	Ser	Leu	Gln	Glu	Leu	Phe	Leu	Ala	His	Ile	Leu	Ser	Pro
465					470					475					480
Trp	Gly	Ala	Glu	Val	Lys	Ala	Glu	Pro	Val	Glu	Val	Val	Ala	Pro	Arg
			485						490					495	
Gly	Lys	Ser	Gly	Ala	Ala	Leu	Ser	Lys	Lys	Ser	Lys	Gly	Gln	Val	Lys
			500					505					510		
Glu	Glu	Gly	Ile	Asn	Lys	Ser	Glu	Lys	Arg	Met	Lys	Leu	Thr	Leu	Lys
		515					520					525			
Gly	Gly	Ala	Ala	Val	Asp	Pro	Asp	Ser	Gly	Leu	Glu	His	Ser	Ala	His
		530				535					540				
Val	Leu	Glu	Lys	Gly	Gly	Lys	Val	Phe	Ser	Ala	Thr	Leu	Gly	Leu	Val
545					550					555					560
Asp	Ile	Val	Lys	Gly	Thr	Asn	Ser	Tyr	Tyr	Lys	Leu	Gln	Leu	Leu	Glu
			565						570					575	
Asp	Asp	Lys	Glu	Asn	Arg	Tyr	Trp	Ile	Phe	Arg	Ser	Trp	Gly	Arg	Val
			580					585					590		

Gly	Thr	Val	Ile	Gly	Ser	Asn	Lys	Leu	Glu	Gln	Met	Pro	Ser	Lys	Glu	
		595					600					605				
Asp	Ala	Ile	Glu	His	Phe	Met	Lys	Leu	Tyr	Glu	Glu	Lys	Thr	Gly	Asn	
	610					615					620					
Ala	Trp	His	Ser	Lys	Asn	Phe	Thr	Lys	Tyr	Pro	Lys	Lys	Phe	Tyr	Pro	
	625				630					635					640	
Leu	Glu	Ile	Asp	Tyr	Gly	Gln	Asp	Glu	Glu	Ala	Val	Lys	Lys	Leu	Thr	
			645						650					655		
Val	Asn	Pro	Gly	Thr	Lys	Ser	Lys	Leu	Pro	Lys	Pro	Val	Gln	Asp	Leu	
			660					665					670			
Ile	Lys	Met	Ile	Phe	Asp	Val	Glu	Ser	Met	Lys	Lys	Ala	Met	Val	Glu	
	675						680					685				
Tyr	Glu	Ile	Asp	Leu	Gln	Lys	Met	Pro	Leu	Gly	Lys	Leu	Ser	Lys	Arg	
	690					695					700					
Gln	Ile	Gln	Ala	Ala	Tyr	Ser	Ile	Leu	Ser	Glu	Val	Gln	Gln	Ala	Val	
	705				710					715					720	
Ser	Gln	Gly	Ser	Ser	Asp	Ser	Gln	Ile	Leu	Asp	Leu	Ser	Asn	Arg	Phe	
			725						730					735		
Tyr	Thr	Leu	Ile	Pro	His	Asp	Phe	Gly	Met	Lys	Lys	Pro	Pro	Leu	Leu	
			740					745					750			
Asn	Asn	Ala	Asp	Ser	Val	Gln	Ala	Lys	Val	Glu	Met	Leu	Asp	Asn	Leu	
		755					760					765				
Leu	Asp	Ile	Glu	Val	Ala	Tyr	Ser	Leu	Leu	Arg	Gly	Gly	Ser	Asp	Asp	
	770					775					780					
Ser	Ser	Lys	Asp	Pro	Ile	Asp	Val	Asn	Tyr	Glu	Lys	Leu	Lys	Thr	Asp	
	785				790					795					800	
Ile	Lys	Val	Val	Asp	Arg	Asp	Ser	Glu	Glu	Ala	Glu	Ile	Ile	Arg	Lys	
			805						810					815		
Tyr	Val	Lys	Asn	Thr	His	Ala	Thr	Thr	His	Asn	Ala	Tyr	Asp	Leu	Glu	
			820					825					830			
Val	Ile	Asp	Ile	Phe	Lys	Ile	Glu	Arg	Glu	Gly	Glu	Cys	Gln	Arg	Tyr	
		835					840					845				
Lys	Pro	Phe	Lys	Gln	Leu	His	Asn	Arg	Arg	Leu	Leu	Trp	His	Gly	Ser	
	850					855					860					
Arg	Thr	Thr	Asn	Phe	Ala	Gly	Ile	Leu	Ser	Gln	Gly	Leu	Arg	Ile	Ala	
	865				870					875					880	
Pro	Pro	Glu	Ala	Pro	Val	Thr	Gly	Tyr	Met	Phe	Gly	Lys	Gly	Ile	Tyr	
				885					890					895		
Phe	Ala	Asp	Met	Val	Ser	Lys	Ser	Ala	Asn	Tyr	Cys	His	Thr	Ser	Gln	
		900						905					910			
Gly	Asp	Pro	Ile	Gly	Leu	Ile	Leu	Leu	Gly	Glu	Val	Ala	Leu	Gly	Asn	
	915						920					925				
Met	Tyr	Glu	Leu	Lys	His	Ala	Ser	His	Ile	Ser	Lys	Leu	Pro	Lys	Gly	
	930					935					940					
Lys	His	Ser	Val	Lys	Gly	Leu	Gly	Lys	Thr	Thr	Pro	Asp	Pro	Ser	Ala	
	945				950					955					960	
Asn	Ile	Ser	Leu	Asp	Gly	Val	Asp	Val	Pro	Leu	Gly	Thr	Gly	Ile	Ser	
				965					970					975		
Ser	Gly	Val	Asn	Asp	Thr	Ser	Leu	Leu	Tyr	Asn	Glu	Tyr	Ile	Val	Tyr	
			980					985					990			
Asp	Ile	Ala	Gln	Val	Asn	Leu	Lys	Tyr	Leu	Leu	Lys	Leu	Lys	Phe	Asn	
		995					1000					1005				
Phe	Lys	Thr	Ser	Leu	Trp											
	1010															

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Val Gly Pro Asp
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